SPECIMEN COLLECTION AND TRANSPORT TABLE

City of Milwaukee Health Department Public Health Laboratories (MHDL)
841 N. Broadway, Room 205, Milwaukee, WI 53202-3653
www.milwaukee.gov/healthlab
email: mhdlab@milwaukee.gov phone: (414) 286-3526 emergencies: (414) 286-2150

- Please use standard bio-safety precautions during packaging and transport of specimens. Transport containers may be returned to sender upon request.
- Specimen submission forms are available from MHDL or from our website listed above.
- If an outbreak is suspected, the laboratory can assist with appropriate test selection, specimen collection and transport information. In addition to clinical specimens, **Environmental, Food, Dairy and Water** testing are available for public health needs. Please contact the laboratory for additional information.
- MHDL can rule out or confirm certain Select Agents following CDC's Laboratory Response Network (LRN) guidelines. Please call (414) 286-3526 with questions.

Additional tests may be available that are not included in this table. Please call the laboratory for more information.

BACTERIOLOGY | MYCOLOGY| PARASITOLOGY | FOOD BACTERIOLOGY | WATER BACTERIOLOGY
CHLAMYDIA | VIROLOGY | SELECT AGENTS | ENVIRONMENTAL PATHOGENS| CHEMISTRY

Organism/ Infection	Specimen/ Site	Specimen Handling	Procedure
BACTERIOLOGY			
Bacterial enteric pathogen: *Salmonella, Shigella, Yersinia, Campylobacter* *E. coli* O157:H7 and other potential enteric pathogens.	Stool	Enteric Pathogen Kit includes one vial each of Carey-Blair (red) transport medium, plastic stool container, laboratory requisition form and instruction sheet. **Transportation:** Store and transport specimen at 2°C-8 °C. **Turnaround Time:** 3-7 days	Appropriate media are inoculated directly with the specimen and also after an enrichment step. Suspected organisms are identified using biochemical tests and serological typing. Sub-typing performed by Pulse-Field Gel Electrophoresis (PFGE) *Call the laboratory for additional information.*
Bacterial reference culture for Identification	Pure culture	No kit is required. **Transportation:** Transport pure culture in a tube or plate at ambient temperature. Note: Anaerobic cultures should be transported to the laboratory promptly, preferably in an anaerobic transport or broth. **Turnaround Time**: 7-21 days	Various biochemical reactions, serological tests, cellular fatty acid analysis and nucleic acid sequencing when applicable.

Organism/ Infection	Specimen/ Site	Specimen Handling	Procedure
BACTERIOLOGY (Cont'd.)			
Bordetella pertussis (Whooping cough) *B. parapertussis*	Nasopharyngeal swab	Pertussis Kit includes: One tube of Regan-Lowe medium, one sterile, blank tube containing glass beads, one calcium alginate (culture) and one Dacron (PCR) NP swab, lab requisition form and instructions. Keep refrigerated until use (DO NOT FREEZE). **Transportation:** Deliver as soon as possible at ambient temperature. If specimens are collected over weekend or holidays, store at 4 °C until transported. **Turnaround Time**: Real-Time PCR: 24 hrs Culture Confirmation: 3-7 days	Culture: Regan-Lowe plates are inoculated with calcium alginate NP swab from transport media incubated at 35°C and examined daily. Characteristic colonies are confirmed by direct fluorescent antibody (DFA). PCR: Real-time PCR assay is performed with dry Dacron NP swabs. Positive and negative results are determined by Cycle-threshold (Ct) values.
Corynebacterium diphtheriae	Throat swab, Nasopharyngeal swab	Transportation: Specimen should be transported as soon as possible. When transportation is delayed, refrigerate **Turnaround Time: 4-6 days**	Culture: Conventional selective media is used in isolation. Identification by Conventional biochemicals, cellular fatty acid analysis and nucleic acid sequencing if applicable. NOTE: All positive isolates referred for toxin testing.
Legionella pneumophila	Respiratory specimens: Sputum, BAL, Bronchial wash, Lung tissue, etc.	**Transportation**: Store and transport specimen at 2°C-8 °C. For extended storage, samples may be frozen -20° C. **Turnaround Time:** Culture: 3-14 days DFA: 24 hrs	Culture: Portions of untreated and acid treated specimen are plated onto selective and non-selective BCYE media plates. Characteristic colonies are identified and confirmed by DFA. DFA: Monoclonal antibodies are used to identify serogroups of *Legionella pneumophila.* Nucleic acid sequencing if applicable.
Mycoplasma (Genital or Oral)	Genital: Swab, urine, biopsy Oral: Sputum, BAL, throat or NP swab	**Transportation:** For optimal recovery, specimens should be stored at 4 °C and delivered within 6 hr. after collection. If not possible, specimen should be placed in appropriate transport media and frozen at -20° C for up to 2 weeks or at 70° C for longer term storage. **Turnaround Time:** Culture: Genital: 2-7 days Oral: 2-6 weeks	Culture: Specimens are cultured using agar-broth technique. Identification is by microscopy and hemagglutination test.
Neisseria gonorrhoeae	Genital swab, rectal swab, throat swab, Urine, pure culture	**Specific Specimen collection kit for endocervical, uretheral, throat, rectal, conjunctival and urine specimens is available upon request.** **Transportation:** Transport specific swab or pure culture on Thayer Martin Agar in CO_2 Bag to the lab at room temperature. Transport urine specimens on wet ice if there is a delay of more than 8hrs.	*Neisseria gonorrhoeae* is detected by rRNA nucleic acid hybridization. Pure culture confirmation involves biochemicals, fluorescent antibody stain and/or nucleic acid probe. URINE ONLY: Target DNA is amplified and detected by homogeneous Strand

		Turnaround time: 1-3 days.	Displacement Amplification (SDA).
Treponema pallidum (Syphilis Screening)	Serum or CSF	Whole blood tubes without anticoagulant, serum or CSF free from visible contamination. **Transportation:** Transport at.4 ^{o}C. Do not freeze. **Turnaround Time:** 24 hrs	VDRL: A non-specific screening test that uses a cardiolipin-based antigen is used to detect Reagin (an anti-lipid substance) in reactive serum or CSF specimens.
Treponema pallidum (Syphilis Confirmation)	Serum only	**Transportation:** Serum specimens are transported as above. **Turnaround Time:** 1-4 days	**TP-PA test** is an Indirect Hemagglutination test used as a confirmatory test for syphilis. Blood serum specimen from a patient is generally used for this test although plasma can also be used. TPPA is used to confirm non-treponemal tests (VDRL or RPR).

Organism/ Infection	Specimen/ Site	Specimen Handling	Procedure
MYCOLOGY			
Ringworm/ dermatophytes	Hair, Skin, Nails	Collect scrapings from the infected site in a small clean transport tube. **Transportation**: Room temperature **Turnaround Time:** 2-6 weeks	Direct exam by light microscopy of stained and unstained preparation. Culture on Sabouraud-Dextrose and Mycobiotic agar plates. Identification by microscopy and characteristic growth on Trichophyton Agar. Also, DNA sequencing as needed.
Referred fungal Isolate for identification	Pure culture of isolate submitted on slant or plate	**Transportation:** Room temperature **Turnaround Time:** 1-4 weeks (possibly longer if slow growth rate)	Isolates cultured on conventional media. Identification by microscopy, DNA sequencing and nucleic acid probes (if applicable)
Blastomyces dermatitidis, Histoplasma capsulatum, Coccidioides immitis	Pure culture of isolate submitted on slant or plate	**Transportation:** Room temperature **Turnaround Time:** 24 hours	Identification using nucleic acid probes
PARASITOLOGY			
Intestinal parasites Parasitic infestations by C*ryptosporidium, Giardia,* amoeba, roundworms, tapeworms etc.	Stool specimens only	Ova & Parasite Kit contains: Formalin & PVA vials, with small plastic spoons attached to inside of lids, a stool collection container, 2 tongue depressors, lab requisition and instruction sheet. **Transportation**: Stool specimens should be stored at 4 ^{o}C before and during transport. Specimens in formalin and PVA can be transported at room temperature. **Turnaround Time:** 1– 5 days	Specimens are concentrated using a formalin-ethyl acetate-extract procedure and examined by light microscopy using stained and unstained wet preparations. Direct immunofluorescent microscopy is used for the simultaneous detection of *Cryptosporidium* oocysts and *Giardia* cysts.
Cyclospora, Isospora	Stool specimen only	Stool should be submitted in 10% Formalin.	Identification by modified acid fast stain

		Transportation: Room temperature	
Microsporidium	Stool specimen only	Stool should be submitted in 10% Formalin. **Transportation**: Room temperature	Identification by modified trichrome stain
Acanthamoeba	Ocular: corneal scrapings, tissue, washings.	Nelson's Saline Transport Media available upon request **Transportation:** Room temperature **Turnaround Time:** 1-7 days	Specimen is plated on non-nutrient agar with bacterial overlay. Plate is examined daily for the presence of trophozoites and cysts.
FOOD BACTERIOLOGY			
Meat Speciation	Ground Beef	**Transportation**: Transport sample to the lab on wet ice within 24 hrs. If delay is expected refrigerate samples. Do not freeze. **Turnaround** Time: 3-4 days	A double immunodiffusion technique is used (Ouchterlony test).
Food – Bacteriological quality	Deli, ready to eat foods, Dairy products (Ice creams, yogurts, frozen desserts)	A minimum of 2 oz. sample is requested. **Transportation**: Transport sample to the lab on wet ice within 24 hrs. If delay is expected refrigerate samples. Do not freeze except frozen dairy products. **Turnaround** Time: 3-4 days	pH, Total Coliforms and Standard Plate Count.
WATER BACTERIOLOGY			
Water Quality	Drinking Water	Leak proof containers with sodium thiosulfate to collect water samples are provided by lab. A minimum of 200mL sample is required. **Transportation**: Transport sample to the lab on wet ice within 24 hrs. **Turnaround** Time: 48 hrs.	Chlorine Content Standard Plate Count IDEXX Colilert-18 or Colilert reagents and Quanti-Tray/2000 approved by Environmental Protection Agency (EPA) are used for the detection and enumeration of total coliforms and *E. coli* in 100 mL of water sample.
Water Pollution	Recreational Water (Beaches, rivers, swimming pools, wading pools)	Leak proof containers to collect water samples are provided by lab. A minimum of 200mL sample is required. **Transportation**: Transport sample to the lab on wet ice within 24 hrs. **Turnaround** Time: 48 hrs.	Detection and enumeration of total coliforms and *E. coli* in 100 mL of water sample by EPA approved method. Pseudomonas Colony Count on request.
Water Sanitation	Environmental Water	Leak proof containers with sodium thiosulfate to collect water sample are provided by lab. A minimum of 200mL sample is requested. **Transportation**: Transport sample to the lab on wet ice within 24 hrs. **Turnaround** Time: 24 hrs.	Chlorine Content Detection and enumeration of total coliforms and *E. coli* in 100 mL of water sample by EPA approved method.
CHLAMYDIA			
Chlamydia trachomatis (Culture)	**Genital swabs:** Endocervical or Urethral **Newborn:** Nasopharyngeal or	Specific transport system for *Chlamydia* is required. Transport swabs or medium available upon request. Please call the lab. **Transportation**: Store specimen at 4 °C soon after collection. DO NOT FREEZE!	Specimen inoculated into McCoy cells, incubated for 3 days, stained by DFA for the detection of *Chlamydia spp.*

	eye swabs	**Turnaround Time**: 3 -5 days	
Chlamydia trachomatis (Nucleic acid Amplification)	**Male**: Urethral or urine. **Female**: Endocervical or urine	Specific transport system is required. Transport swabs available upon request. Please call the laboratory. **Transportation**: Transport swab to the lab at room Temperature. **Turnaround Time:** 24 hrs	Target DNA is amplified and detected by homogeneous Strand Displacement Amplification (SDA)

Organism/ Infection	Specimen/ Site	Specimen Handling	Procedure
CHLAMYDIA (Cont'd.)			
Chlamydia pneumoniae	Nasopharyngeal throat swabs, BAL, bronchial washings	Washings; lavages; swabs without antibiotics that are designed for collection of *Chlamydia*. Transport media available upon request. Please call the lab. **Transportation**: Store specimen at 4 °C soon after collection. Keep refrigerated during transport. DO NOT FREEZE! **Turnaround Time:** Culture: 3-10 days PCR: 24 hrs	Culture on HEp-2 cells and incubated for 3 days. Cells then stained with fluorescent antibody (FA) to detect the presence of *Chlamydia* elementary bodies. All initial negatives are blind passaged.
VIROLOGY			
Viral ID: Referred viral culture for identification; virus isolation from clinical samples by distinct Cytopathic effect (CPE) in cell culture	Isolate submitted in viral transport media	Collect sample and transport at 4 °C or place on wet ice. DO NOT FREEZE! **Turnaround Time**: 1-14 days.	Cell culture: Virus isolation on cell lines Real-time PCR may be used for confirmation as available.
Norovirus (NoV)	Stool sample	**Please call the Laboratory if outbreak suspected.** Collect fresh stool in a clean container, label appropriately and complete the test requisition. **Storage:** Specimen can be stored at 4 °C until transported. **Transporation:** Transport specimen at 4 °C. **Turnaround Time:** PCR: 24 hrs	Real-time Reverse Transcription (RT) PCR assay is performed on stool specimens to identify NoV Genogroups I and II. Positive and negative results are determined by Cycle-threshold (Ct) values.
Enterovirus	Throat swab, stool, CSF, skin vesicle swab, tissue biopsy	Collect fresh stool, CSF (1-2 ml) and swabs in viral transport media. **Storage:** Store at 4°C. DO NOT FREEZE! **Transportation:** Transport at 4 °C. **Turnaround Time:** Culture: 1-14 days PCR: 24 hrs	Cell culture: Specimens are inoculated on various cell lines. Culture plates are read daily for characteristic cytopathic effect (CPE) and all positives are reported the day cell cultures become positive. All isolates are serotyped. Negative results reported after 9-11 days. Real-time RT-PCR

Human Parechovirus (HPeV)	Throat swab, stool, rectal swab, CSF, Tissue biopsy	Collect fresh stool, CSF (1-2 ml) and swabs in viral transport media. **Transport** at 4 °C **Turnaround** time: Culture: 1-14 days PCR: 24 hrs	Cell culture: Virus isolation on cell lines Real-time RT-PCR

Organism/ Infection	Specimen/ Site	Specimen Handling	Procedure
VIROLOGY (cont'd)			
Herpes Simplex Virus (HSV Types 1 and 2)	Lesion swab, mucosal swab, tissue biopsy, CSF, ocular fluid	Collect swabs or other clinical samples in viral transport media **Storage:** Store at 4 °C. DO NOT FREEZE! **Transportation:** 4 °C **Turnaround Time:** Culture: 1-14 days PCR: 24 hrs	Cell culture: Virus isolation on cell lines. DFA: For culture confirmation and typing. Real-Time PCR.
Varicella-Zoster Virus (VZV)	Lesion swab, mucosal swab, CSF, ocular specimen	Collect CSF (1-2 ml) and swabs in viral transport media. Transport at 4° C. **Turnaround Time:** Culture: 1-14 days PCR: 24 hrs	Cell culture: Virus isolation on cell lines DFA for culture confirmation Real-time PCR
Varicella Serology	Serum or whole blood in separator tube	**Storage:** 4°C **Transport:** 4°C **Turnaround Time: 1-4 days**	IFA for IgG antibody
Cytomegalovirus (CMV)	Isolate submitted in viral transport media; BAL, tissue biopsy, saliva, blood, CSF, plasma, urine	**Transport** at 4 °C or place on wet ice. DO NOT FREEZE! **Turnaround Time:** Culture: 1-14 days Shell vial 1-3 days Real time PCR; 24 hrs	A shell vial is stained for CMV Immediate Early Antigen by Indirect Fluorescent Antibody (IFA) at 24-72 hrs Real time –PCR (for culture confirmation)
CMV Serology	Serum or whole blood in separator tube	**Storage:** 4°C **Transport:** 4°C **Turnaround Time: 1-4 days**	IFA for IgG and IgM antibodies
Influenza (A & B)	NP & throat swabs, wash, aspirates, BAL	Collect swabs or other clinical samples in viral transport media. **Storage:** 4 °C. DO NOT FREEZE T**ransportation:** 4 °C . **Turnaround Time:** Culture: 1-14 days PCR: 24 hrs ***If suspect avian influenza, please call the laboratory prior to submission.***	Cell culture: Virus isolation on cell lines DFA: For culture confirmation. Real-Time RT-PCR: Influenza A (H1, 2009 H1N1, H3, H5) and B
Respiratory Syncytial Virus (RSV)	NP & throat swab, aspirates, BAL, lung tissue	Collect swabs or other clinical samples in viral transport media. **Storage:** 4 °C. DO NOT FREEZE **Transportation:** 4 °C. **Turnaround Time:** Culture: 3-14 days	Cell culture: Virus isolation on cell lines DFA for culture confirmation Real-time RT-PCR

		RT-PCR: 24 hrs.	
Parainfluenza (Types 1-4)	NP & throat swab, aspirates, BAL, lung tissue	Collect swabs or other clinical samples in viral transport media. **Storage:** 4 °C. DO NOT FREEZE **Transportation:** 4 °C. **Turnaround Time:** Culture: 1-14 days PCR: 24 hrs (types 1-3)	Cell culture: Virus isolation on cell lines DFA for culture confirmation. Real-time RT-PCR
Adenovirus	Throat, eye, NP swabs, BAL, blood, urine, stool	Collect swabs or other clinical samples in viral transport media. **Storage:** 4 °C. DO NOT FREEZE **Transportation:** 4 °C. **Turnaround Time:** Culture: 1-14 days PCR: 24 hrs.	Cell culture: Virus isolation on cell lines . DFA for culture confirmation. Real time PCR
Rhinovirus (HRV)	NP & throat swab, aspirates, BAL	Collect swabs or other clinical samples in viral transport media. **Storage:** 4 °C. DO NOT FREEZE **Transportation:** 4 °C. **Turnaround Time:** Culture: 1-14 days	Cell culture: Virus isolation on cell lines.
Mumps Virus	NP swabs, saliva, CSF, urine, blood	Collect swabs or other clinical samples in viral transport media. **Storage:** 4 °C. DO NOT FREEZE! **Transportation:** 4 °C. **Turnaround Time:** Culture: 1-14 days PCR: 24 hrs	Cell culture: Specimens are inoculated on various cell lines. Negative results reported after 9-11 days. Real-time RT-PCR
Mumps Serology	Serum or whole blood in separator tube	**Storage:** 4°C **Transport:** 4°C **Turnaround Time: 1-4 days**	Enzyme Immunoassay (EIA) for IgG antibody
Measles Virus (Rubeolla)	Throat swab, urine	Collect swabs in viral transport media. Send a minimum of 10 ml urine in a sterile sample cup. **Storage:** 4°C DO NOT FREEZE **Transport:** 4°C **Turnaround Time:** Culture: 1-14 days PCR: 24 hours	Cell Culture: Virus isolation on cell lines DFA for culture confirmation Real-Time RT-PCR
Measles Serology	Serum or whole blood in separator tube	**Storage:** 4°C **Transport:** 4°C **Turnaround Time: 1-4 days**	Enzyme Immunoassay (EIA) for IgG and/or IgM antibodies.
Rubella	Throat swab, urine	Collect swabs in viral transport media. Send a minimum of 10 ml urine in a sterile sample cup. **Storage:** 4°C DO NOT FREEZE **Transport:** 4°C **Turnaround Time:** PCR: 24 hours	Real-Time RT-PCR
Rubella Serology	Serum or whole blood in separator	**Storage:** 4°C **Transport:** 4°C	Enzyme Immunoassay (EIA) for IgG and/or IgM antibodies.

	tube	**Turnaround Time: 1-4 days**	
SELECT AGENTS			
Suspect Select Agent as listed by CDC Select Agent Program	Clinical or Environmental	**Please Contact the Laboratory** **'Chain of Custody' should be maintained**	CDC/LRN Protocols for conventional and Real-time PCR assays **Emergency (24-7) Contact (414) 286-2150**

Organism/ Infection	Specimen/ Site	Specimen Handling	Procedure
ENVIRONMENTAL PATHOGENS			
Cryptosporidum/ Giardia	Raw source water, Treated water etc.	Water must be processed through a special filter or collected in a vessel (carboy). Call laboratory for additional information or for collection vessel. **Transportation**: 4℃ Storage: If samples are collected over weekend or holidays, store at 4℃ until transported. **Turnaround** time: 2-7 days	The validated USEPA Method 1623: *Cryptosporidium* and *Giardia* in water by Filtration/IMS/FA.
Culturable Viruses	Raw source water or treated water	Water must be processed through a special virus filter. Collection apparatus and filters are available. **Transport:** 4℃ **Turnaround Time:** 28 days	Samples are processed according to the EPA-ICR protocol. Cell Culture: Virus isolation on cell lines.
Analyte	**CHEMISTRY**		
Lead, Blood	Whole Blood, venous or finger puncture	Collect whole blood in Vacutainer tube containing EDTA or heparin. Capillary tubes are not acceptable. Pediatric minimum specimen is 250 microliters (µl). **Storage**: 4 °C. **Transportation**: 4 °C . **Turnaround Time**: 3-5 days	Graphite Furnace Atomic Absorption Spectrometry Primarily used for pediatric lead poisoning detection. Acceptable Range: Children: 0-9 ug/100mL Adults: 0-40 ug/100mL Please see the Milwaukee Health Department recommendations for the interpretation of lead levels.
			For information on incidence of lead poisoning in the City of Milwaukee call 414-225-LEAD or visit them at: www.milwaukee.gov/health/lead/index.htm
Lead, Environmental	Wipes, swabs, paint, soil	Housing units selected by Environmental Health inspectors: Wipes: Store in Whirl-pak or similar plastic bag Paints: Store in Whirl-pak or similar plastic bag Soil: Store in disposable 50ml plastic centrifuge tube Water sample testing **Turnaround Time:** 3-5 days	Flame Atomic Absorption Spectrometry Graphite Furnace Absorption Spectrometry for water samples Contact the MHD Lead Program 286-5788 or 286-5119
Asbestos	Any construction or	Possible asbestos containing material should be collected	Polarized Light Microscopy

	demolition products that may contain asbestos (e.g. insulation, siding, roofing, flooring) Aqueous solutions	and sealed by a trained inspector before transporting to the lab. Proper sealing is very important to prevent environmental contamination. **Turnaround Time:** 1-5 days Stored in capped plastic bottles **Turnaround Time:** 1-2 days	Contact the Department of Neighborhood Services pH and conductivity meter

NOTE: For optimal recovery of micro-organisms, specimens should be processed within 2 hr. of collection.

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